

has removed them. A case in point was met with in other members of the same group. When Mendeléeff enunciated his generalisation the accepted atomic weights of osmium, iridium, and platinum were found to be not in accordance with the provisions of the law, and Seubert showed that Mendeléeff's surmise that the numbers were inaccurate was correct. The proper sequence of the elements has now been established, although we concur with Dr. Friend that, with the exception of that of platinum, which, thanks to the careful experiments of Archibald, published in the Proceedings of the Royal Society of Edinburgh, is now well determined, the values of the other members, especially of osmium and iridium, fall very far short of the standard demanded by modern atomic weight work.

It may be hoped that we shall not have long to wait for new and more accurate determinations. These elements, it is true, present special difficulties, accentuated, no doubt, by the present scarcity of material. Indeed, the term "rare elements," originally applied to some of those of Group iii., is in these strenuous and evil days more appropriate to the members of the platinum group.

We presume that part ii., devoted to iron and its compounds, will complete the entire work of ten volumes, when we hope to be able to congratulate Dr. Friend and his coadjutors on the termination of their task. The complete treatise will form an admirable contribution to the chemical literature of this country, philosophical in plan, comprehensive in treatment, and accurate in detail, not the least of its merits being its excellent bibliography.

Our Bookshelf.

Practical Plant Biochemistry. By Muriel Wheldale Onslow. Pp. vii+178. (Cambridge: At the University Press, 1920.) Price 15s. net.

THE author indicates that her book is primarily intended for students of botany, and that it should be a guide to practical work. It is stated that the volume is planned to supplement the knowledge of plant products which students obtain in their study of organic chemistry and of plant physiology. The introduction is followed by eight chapters, each giving a brief survey of some portion of the chemistry of plant life—e.g. the colloidal state (chap. ii.), carbon assimilation (chap. iv.), glucosides and glucoside-splitting enzymes (chap. ix.). The general matter of the chapters is followed by, or interspersed with, data upon which experimental work can be carried out to illustrate the points dealt with in the respective chapters. A list of references to original literature

is given at the end of each chapter, and cross-references are frequently employed. As to errors, it is rather surprising that those in the structural formulæ for α - and β -glucose on p. 48 (where the formulæ are used to illustrate a statement concerning the two forms) should have been overlooked.

The chapter on plant bases (chap. x.) consists rather too largely of a list of names, to which are attached complex structural formulæ that are more likely to confuse the students who have "an elementary knowledge of organic chemistry" than to be of assistance to them. But for the somewhat disjointed effect resulting from the method of introducing the experimental instructions, the matter is presented in an interesting form, and on the whole there is a pleasing freedom from dogmatic assertions concerning unknown or uninvestigated chemical changes, which so frequently detract from the value of works of this type. The general survey of the problems involved in the chemistry of plant life, and the instructions for experimental work which this volume contains, should prove both useful and interesting to the class of student for whom it was written, and to many others who are interested in the chemistry of the plant world.

A. E. E.

Vergleichende Anatomie des Nervensystems. Erster Teil., Die Leitungsbahnen im Nervensystem der Wirbellosen Tiere. Von Æ. B. Droogleever Fortuyn. Pp. viii+370. (Haarlem: De Erven F. Bohn, 1920.) 12.50 guilders.

THE author is to be congratulated on this excellent digest of the known facts regarding the paths of conduction in the nervous system of invertebrates—a work which has entailed careful reading of the extensive and complicated literature of the subject and skilful collation of the results. He gives an account of the principal issues of the researches—treated for the most part in historical sequence—on the arrangement of the sensory cells and ganglion cells and the course of their processes, so far as this has been ascertained, in each phylum of invertebrates. The internal structure of the cell and the intracellular neurofibrillæ are not discussed. After dealing with the Porifera in less than a page, there being no evidence of the presence of nervous elements in sponges, the author examines in turn the Cœlentera, Vermes, Mollusca, Echinoderma, Arthropoda, Bryozoa, Tunicata, and Amphioxus, the last-named being included because its nervous system presents a number of features in common with that of invertebrates. In some cases—e.g. Echinoderma, Bryozoa, Tunicata—our knowledge of the paths of conduction is extremely slight, but in others—e.g. Annelida and Decapod Crustacea—there is an extensive literature which has received full consideration. The digest, illustrated by 116 diagrams, shows clearly what has been done, and renders obvious how much still remains to be done to elucidate the detailed structure of the

nervous system of invertebrates, for, as the author remarks, we have as yet only an imperfect conception of the various conduction paths in the ganglia of the earthworm's nerve-cord, although these ganglia have been investigated more than any other part of the nervous system of any invertebrate.

J. H. A.

A Guide to the Old Observatories at Delhi; Jaipur; Ujjain; Benares. By G. R. Kaye. Pp. vii+108+xv plates. (Calcutta: Superintendent Government Printing, India, 1920.) Price 3s. 6d.

THIS little book is an abstract of the larger publication on the same subject which was reviewed in NATURE, vol. ciii., p. 166. It is evidently intended for travellers who have seen one or more of these curious and gigantic instruments and wish to know something about their origin. All the tabular matter and similar details have been omitted, while the clear descriptions and some of the excellent pictures have been retained. We could have wished that the author had omitted from this guide-book his remarks about the supposed scientific knowledge of Jai Singh. It cannot be denied that this man, living in the eighteenth century, not only was quite unaware of what had been done in Europe during the previous two hundred years to improve the construction of instruments, but also did not even make the slightest advance on the work of the Greek and Arabian astronomers. All he did was to copy some instrumental monstrosities erected at Samarkand three hundred years before his time, and it is no wonder that little or no use was ever made of them.

- (1) *Reports on Hides and Skins.* Pp. ix+123.
 (2) *Reports on Oil-seeds.* Pp. ix+149. (Imperial Institute. Indian Trade Inquiry.) (London: John Murray, 1920.) Price 6s. net each vol.

IN 1916 the Imperial Institute Committee for India was invited to inquire into the possibility of the increased use of Indian raw materials within the Empire. Various committees were set up to deal with the principal groups of materials selected for the inquiry, and the present volumes are the reports of those dealing with hides and skins and with oil-seeds. In the report on the former materials (1) it is shown that the pre-war trade in "kips" was almost entirely with Germany and Austria. During the war the Government was able to utilise most of the material produced, and proposals are made for preventing the return of the trade to the countries of Central Europe. For this purpose a preferential export duty is proposed; also the leading tanners of the Empire have been approached, and they have agreed that they can utilise all the hides produced by India. Suggestions are also made for improving the quality of the hides. Statistics showing the export trade between 1910 and 1918 in raw cow-

hides, buffalo hides, and goat and sheep skins have been inserted. The report of the committee dealing with oil-seeds (2) discusses the position of the trade in that commodity with England, Germany, and France at some length. It is pointed out that there is likely to be a serious shortage of fats in the world, and a system of rationing is recommended in order to secure adequate supplies to Great Britain and her Allies. It is further suggested that a preferential import tax on vegetable oils should be levied at our ports, and that there should be co-operation between the seed-crushers, the banks, the Government, and the transport companies with the view of facilitating the transit or re-export trade and of reducing the cost of production. Statistics for 1895 onwards of the trade in ten different kinds of oil-seeds produced in India are given.

Immunity in Health: The Function of the Tonsils and other Subepithelial Lymphatic Glands in the Bodily Economy. By Prof. K. H. Digby. Pp. viii+130. (London: Henry Frowde, and Hodder and Stoughton, 1919.) Price 8s. 6d. net.

IN this book Prof. Kenelm Digby discusses the functions which may be performed by such structures as the tonsils, the intestinal lymphoid follicles, and the vermiform appendix, all of which are essentially lymphoid organs grouped by the author under the term "subepithelial lymphatic glands." The disadvantage of these structures in the body is their proneness to bacterial invasion and infection. The tonsils and appendix are, moreover, frequently removed by operation without any apparent effect due to their loss. The utility of these glands has, therefore, been doubted, and the appendix is commonly regarded as a vestigial organ in process of reduction. It is noteworthy that all these structures are located in situations—mouth, throat, and intestine—where large masses of bacteria are present, that they freely ingest bacteria, and that they occur only in birds and mammals, the highest and most differentiated of animals.

The hypothesis put forward by the author of the use of the subepithelial collections of lymphoid tissue is that they play an important function in immunising the body against pathogenic bacteria in proximity to the tissues—they are immunising stations, so to speak. The several tonsils form a protective circum-pharyngeal ring, and the Peyer's patches, appendix, and solitary follicles are distributed over the intestine—localities which are most in need of protection from bacterial invasion. In the stomach, on the other hand, lymphoid structures are almost absent, but here the acid nature of the secretion is sufficiently protective without their aid. The argument is sustained by a number of anatomical, microscopical, and clinical observations and data, and we think the author has made out a good case. The book is illustrated with several original drawings and diagrams.

R. T. H.